



Ministry of Higher Education and
Scientific Research - Iraq
Northern Technical University
Technical Engineering College
Electronics and Control Engineering Dep.



MODULE DESCRIPTOR FORM

نموذج وصف المادة الدراسية

Module Information			
معلومات المادة الدراسية			
Module Title	ELECTRONICS		Module Delivery
Module Type	CORE		<input checked="" type="checkbox"/> Theory <input type="checkbox"/> Lecture <input checked="" type="checkbox"/> Lab <input checked="" type="checkbox"/> Tutorial <input type="checkbox"/> Practical <input type="checkbox"/> Seminar
Module Code	RETE 200		
ECTS Credits	7		
SWL (hr/sem)	175		
Module Level	2	Semester of Delivery	
Administering Department	Electronics and Control Eng.	College	Technical Engineering College -Kirkuk
Module Leader		e-mail	
Module Leader's Acad. Title	Asst. lecture	Module Leader's Qualification	M.Sc.
Module Tutor	None	e-mail	None
Peer Reviewer Name	Asst. Lect.	e-mail	@ntu.edu.iq
Review Committee Approval	01/06/2023	Version Number	1.0

Relation with Other Modules			
العلاقة مع المواد الدراسية الأخرى			
Prerequisite module	None	Semester	

Co-requisites module	None	Semester	
Module Aims, Learning Outcomes and Indicative Contents أهداف المادة الدراسية ونتائج التعلم والمحتويات الإرشادية			
Module Aims أهداف المادة الدراسية	<ol style="list-style-type: none"> 1. Providing a clear explanation about the operation of basic semiconductor devices available today. 2. To show how each device and its characteristics is used in appropriate circuit 3. Understanding the fundamentals of circuit analysis and analogue electronics and it is a basic introduction to electronic theory for a set of electronics-based programmers. 4. Understanding the basic concepts that are used and built upon in future years. 5. Recognize the fundamentals of basic electric components and circuits and analyses simple electric circuits. 6. Explain basic input and output electronics for the electric circuits. 7. Introduces resources to support learning and their use to develop a resilient approach to learning. 8. Introducing students to the language and methodologies that engineers use to solve problems. 9. Teaching the ability to analyze any DC circuit, and simple electronic circuits containing diodes and transistors. 		
Module Learning Outcomes مخرجات التعلم للمادة الدراسية	<ol style="list-style-type: none"> 1. Students will be able to understand the operation of simple power supply circuits and specify components for a given performance and be able to discuss and explain them. 2. Students will be able to understand the electrical characteristics of diodes and analyses simple analogue circuits containing these elements and be able to discuss and explain them. 3. Students will be able to analysis the diode characteristics and equations, ideal vs real. Signal conditioning, clamping and clipping, Zener diodes and power supplies. 4. Students will be able to demonstrate broad knowledge of electronic components: their construction, function and application in an electronic circuit, and have the ability to build a working electronic circuit using these components, from a given design. 5. Students will be able to demonstrate the ability to design, build and test a printed circuit board based on knowledge of component function and competent use of CAD software and established design rules. 6. Students will be able to demonstrate the ability to accurately present the outcomes of an experiment using a laboratory logbook 		
Indicative Contents المحتويات الإرشادية	Indicative content includes the following.		

	<ol style="list-style-type: none"> 1. Introduction to Semiconductors <ul style="list-style-type: none"> ○ The Atom ○ Materials Used in Electronic Devices ○ Current in Semiconductors ○ N-Type and P-Type Semiconductors ○ The PN Junction 2. Diodes and Applications <ul style="list-style-type: none"> ○ Diode Operation ○ Voltage-Current (V-I) Characteristic of a Diode ○ Diode Approximations ○ Half-Wave Rectifiers ○ Full-Wave Rectifiers ○ Power Supply Filters and Regulators ○ Diode Limiters and Clampers ○ Voltage Multipliers ○ The Diode Datasheet 3. Special-Purpose Diodes <ul style="list-style-type: none"> ○ The Zener Diode ○ Zener Diode Applications ○ Device Application 4. Bipolar Junction Transistors <ul style="list-style-type: none"> ○ Bipolar Junction Transistor (BJT) Structure ○ Basic BJT Operation ○ BJT Characteristics and Parameters.
Learning and Teaching Strategies استراتيجيات التعلم والتعليم	
Strategies	<p>The learning and teaching strategy is designed to achieve the following aims:</p> <ol style="list-style-type: none"> 1. communicate knowledge and information on basic electronic circuits 2. engage students in the analysis and understanding of basic electronic circuits through a combination of theory lectures, tutorials problem sheets. 3. communicate knowledge on ethical behavior in work environment through lectures. 4. communicate information on opportunities in electronic engineering paths through lectures.

Student Workload (SWL) الحمل الدراسي للطالب			
Structured SWL (h/sem) الحمل الدراسي المنتظم للطالب خلال الفصل	93	Structured SWL (h/w) الحمل الدراسي المنتظم للطالب أسبوعياً	6.2
Unstructured SWL (h/sem) الحمل الدراسي غير المنتظم للطالب خلال الفصل	82	Unstructured SWL (h/w) الحمل الدراسي غير المنتظم للطالب أسبوعياً	5.46
Total SWL (h/sem) الحمل الدراسي الكلي للطالب خلال الفصل	175		

Module Evaluation تقييم المادة الدراسية					
		Time/Number	Weight (Marks)	Week Due	Relevant Learning Outcome
Formative assessment	Quizzes	5	10% (10)	4,8,9,11,13	LO #3, 6,8, 10 and 11
	Assignments	5	10% (10)	2, 4,6,10,12	LO # 3, 7, 9,12 and 14
	Report / Lab.	10	10% (10)	Continuous	2,4,6,7,8,9,10,11,12,13
	Projects	1	10% (10)	13	LO # 5, 8 and 10
Summative assessment	Midterm Exam	2hr	10% (10)	7	LO # 1-7
	Final Exam	3hr	50% (50)	16	All
Total assessment		100% (100 Marks)			

Delivery Plan (Weekly Syllabus) المنهاج الأسبوعي النظري	
	Material Covered
Week 1	Introduction to Atom, Material Used in Electronics, Current in Semiconductors.
Week 2	N- Type and P- Type Semiconductors, The PN Junction.
Week 3	Diode Operation, Voltage- Current (V-I) Characteristics.
Week 4	Diode Models, Half-Wave Rectifiers.
Week 5	Full-Wave Rectifiers, Power Supply Filters and Regulators.
Week 6	Diode Limiters and Clampers, Voltage Multipliers.
Week 7	The Zener Diode, Zener Diode Applications.
Week 8	Mid-term Exam
Week 9	Bipolar Junction Transistor (BJT) Structure.
Week 10	Basic BJT Operation

Week 11	BJT Characteristics and Parameters
Week 12	Transistor Bias Circuits and the DC Operating Point
Week 13	Voltage-Divider Bias
Week 14	Other Bias Methods
Week 15	Preparatory Week
Week 16	Final Exam

Delivery Plan (Weekly Lab. Syllabus) المنهاج الاسبوعي للمختبر	
	Material Covered
Week 1-2	Lab 1: The Diode Characteristic <ul style="list-style-type: none"> • Part 1: Characteristic of PN Junction Diode Curve (Forward Bias) • Part 2: Characteristic of PN Junction Diode Curve (Reverse Bias)
Week 3-5	Lab 2: Diode Applications <p style="margin-left: 40px;">Part 1: Diode Rectifiers</p> <ul style="list-style-type: none"> • Half-wave rectifier. • Center-tapped full-wave rectifier. • Full-wave rectifier circuit. <p style="margin-left: 40px;">Part 2: Diode Rectifiers with Filter.</p> <ul style="list-style-type: none"> • Half-wave rectifier with Filter • Full-wave rectifier circuit with Filter.
Week 6	Lab 3: Diode Clipping Circuits
Week 7	Lab 4: Diode Clamping Circuits
Week 8	Lab 5: Voltage Doubler Circuit.
Week 9-12	Lab 6: Special-Purpose Diodes <p style="margin-left: 40px;">Part 1: Static Characteristic of Zener Diode.</p> <p style="margin-left: 40px;">Part 2: The Zener Diode and Regulator</p> <ul style="list-style-type: none"> • Out-Put Voltage Regulation by Zener Diode using V_{in} Varying.

	<ul style="list-style-type: none"> Out-Put Voltage Regulation by Zener Diode using R_L Varying.
	Part 3: Diode Clipping Circuits using Zener Diode.
Week 13-14	Lab 7: Transistor Static Characteristic <ul style="list-style-type: none"> Common-Base Transistor Connection Common-Emitter Transistor Connection

Learning and Teaching Resources مصادر التعلم والتدريس		
	Text	Available in the Library?
Required Texts	Electronic Devices' Conventional Current Version, by Thomas L. Floyd, Tenth Edition.	Yes
Recommended Texts	Electronic Devices and Circuit Theory' by Robert Boylestad Louis Nashelsk, Ninth Edition.	No
Websites		

APPENDIX:

GRADING SCHEME مخطط الدرجات				
Group	Grade	التقدير	Marks (%)	Definition
Success Group (50 - 100)	A - Excellent	امتياز	90 - 100	Outstanding Performance
	B - Very Good	جيد جدا	80 - 89	Above average with some errors
	C - Good	جيد	70 - 79	Sound work with notable errors
	D - Satisfactory	متوسط	60 - 69	Fair but with major shortcomings
	E - Sufficient	مقبول	50 - 59	Work meets minimum criteria
Fail Group (0 - 49)	FX – Fail	مقبول بقرار	(45-49)	More work required but credit awarded
	F – Fail	راسب	(0-44)	Considerable amount of work required

Note:

NB Decimal places above or below 0.5 will be rounded to the higher or lower full mark (for example a mark of 54.5 will be rounded to 55, whereas a mark of 54.4 will be rounded to 54. The University has a policy NOT to condone "near-pass fails" so the only adjustment to marks awarded by the original marker(s) will be the automatic rounding outlined above.



ملاحظة: هذا النموذج تم وضعه وتقديمه من قبل مديريةية ضمان الجودة في وزارة التعليم العالي والبحث العلمي